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EXAMINER

SHINGLES, KRISTIE D

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 09/886,186
Filing Date: June 21, 2001
Appellant(s): CRADDOCK ET AL.

Lisa L.B. Yociss
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 6, 2005 appealing from the Office action mailed July 27, 2005.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

No amendment after final has been filed.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,459,698	ACHARYA	10-2002
2004/0128398	PETTEY	07-2004
2001/0049740	KARPOFF	12-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

1. Claims 1-42 are presented for examination.
2. **Claims 1-25, 27-31, 33-37 and 39-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Acharya* (USPN 6,459,698) in view of *Petty* (US Publication 2004/0128398). This rejection was set forth in the previous Office action mailed July 27, 2005.**
3. Per claim 25, *Acharya* teaches a method of routing data between a system area network and an external network, comprising: receiving, within an Internet Protocol (IP) router, data from a host channel adapter that utilizes an Infiniband (IB) protocol as its network protocol for data communications, the IP router utilizing IP as its networking protocol for data communications, the IP router being connected directly to the host channel adapter (col.2 lines 18-46, col.3 line 45-col.4 line 22 and col.7 line 52-col.8 line 21); parsing a routing header of the data (col.2 lines 24-44 and col.7 line 49-col.8 line 10); identifying an output port of the router based on the parsing of the routing header (col.2 lines 36-46, and col.7 line 52-col.8 line 21); and sending the data out of the router via the identified output port (col.2 lines 36-46, col.6 lines 43-56 and col.7 line 63-col.8 line 21).

Although *Acharya* teaches outputting data via identified virtual lanes based on information acquired from parsing the router header (col.7 line 63-col.8 line 21), *Acharya* fails to explicitly teach outputting the data via an identified output port. However, *Petty* teaches the selection of an output port based on the parsed header data (paragraphs 0052-0059, 0061, 0068, 0088, 0102-0104, 0112-0116 and 0136). It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of *Acharya* and *Petty* for the purpose of identifying an output port from the parsed data in the routing header; because the

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routing header is known for specifying destination and port information in order to efficiently accomplish routing the communicated data from the source to the appropriate destination and interface.

4. Per claim 1, *Acharya* teaches a method of transmitting data packets from a system area network device to an external network device, comprising: passing data generated by a host process to a host channel adapter that utilizes an Infiniband (IB) protocol as its networking protocol for data communications (col.2 lines 18-46 and col.7 line 52-col.8 line 7); and passing the data from the host channel adapter directly to an Internet Protocol (IP) router that uses IP as its networking protocol for data communications, the router being connected directly to the host channel adapter, the router also being coupled to an external network that utilizes IP as its networking protocol for data communications (col.2 lines 28-41, col.3 line 45-col.4 line 22 and col.7 line 52-col.8 line 21).

5. Claims 1, 9, 17, 31 and 37 contain limitations that are substantially equivalent to claim 25 and are therefore rejected under the same basis.

6. Per claim 2, *Acharya* and *Petty* teach the method of claim 1, *Petty* further teaches the method, wherein passing the data generated by a host process to a host channel adapter included in a host includes invoking an Internet Protocol (IP) over InfiniBand (IB) device driver in the host (paragraphs 0019, 0081-0088, 0101-0106 and 0126).

7. Claims 10 and 18 are substantially equivalent to claim 2 and are therefore rejected under the same basis.

8. Per claim 3, *Petty* teaches the method of claim 2, wherein passing data generated by a host process to a host channel adapter includes creating an IP over IB Queue Pair in the host

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channel adapter for use with the IP over IB device driver (paragraphs 0022-0023, 0085-0092, 0097-0099, 0102-0112, 0121 and 0134-0142; *Acharya*: col.3 line 66-col.4 line 55 and col.6 lines 5-23).

9. Claims 11 and 19 are substantially equivalent to claim 3 and are therefore rejected under the same basis.

10. Per claim 4, *Petty* teaches the method of claim 2, wherein the step of passing data generated by a host process to a host channel adapter is performed in response to an I/O Transmit transaction being received by the IP over IB device driver (paragraphs 0016-0019, 0022-0026, 0041, 0058-0059, 0075-0085, 0098, 0110-0116 and 0130-0134; *Acharya*: col.6 lines 43-56 and col.7 lines 6-28).

11. Claims 12 and 20 are substantially equivalent to claim 4 and are therefore rejected under the same basis.

12. Per claim 5, *Petty* teaches the method of claim 4, wherein the I/O Transmit transaction originates from one of a user level program and a kernel level program (paragraphs 0022-0026 and 0048-0059).

13. Claims 13 and 21 are substantially equivalent to claim 5 and are therefore rejected under the same basis.

14. Per claim 6, *Petty* teaches the method of claim 4, wherein the I/O Transmit transaction includes one or more pointers to one or more memory regions which contain the data, and wherein the I/O Transmit transaction further includes one of a destination address and destination address handle (paragraphs 0016-0025, 0051-0054, 0058-0061, 0071, 0081-0084,

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0088-0092, 0102, 0124 and 0130-0134; *Acharya*: col.4 lines 4-22, col.6 lines 5-56 and col.7 lines 6-44).

15. Claims 14 and 22 are substantially equivalent to claim 6 and are therefore rejected under the same basis.

16. Per claim 7, *Acharya* and *Petty* teach the method of claim 1, *Petty* further teaches the method, wherein passing data generated by a host process to a host channel adapter includes using a Post Send verb to instruct the host channel adapter to send data from system memory to a designated destination (paragraphs 0019, 0051-0058, 0071, 0082-0090, 0093, 0098 and 0115-0123; *Acharya*: col.1 line 59-col.2 line 11, col.4 lines 4-13 and col.5 lines 24-39).

17. Claims 15 and 23 are substantially equivalent to claim 7 and are therefore rejected under the same basis.

18. Per claim 8, *Acharya* and *Petty* teach the method of claim 1, *Acharya* further teaches the method, wherein the data is passed to the host channel adapter as one of a Raw Datagram and an Unreliable Datagram (col.3 lines 19-26, col.5 lines 24-39, col.5 line 64-col.6 line 4, col.6 lines 5-23 and col.7 lines 58-62).

19. Claims 16 and 24 are substantially equivalent to claim 8 and are therefore rejected under the same basis.

20. Per claim 27, *Acharya* and *Petty* teach the method of claim 25, *Petty* further teaches the method, wherein if the data is an Unreliable Datagram and the identified output port is not an InfiniBand output port, only an InfiniBand Transport Header associated with the data is discarded (paragraphs 0026, 0127-0128, 0131-0132 and 0135-0138).

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21. Claims 33 and 39 are substantially equivalent to claim 27 and are therefore rejected under the same basis.

22. Per claim 28, *Acharya* and *Petty* teach the method of claim 25, *Petty* further teaches the method, wherein sending the data out of the router includes creating an InfiniBand link layer header for the data (paragraphs 0104 and 0112; *Acharya*: col.6 lines 5-56).

23. Claims 34 and 40 are substantially equivalent to claim 28 and are therefore rejected under the same basis.

24. Per claim 29, *Petty* teaches the method of claim 28, wherein the InfiniBand link layer header identifies a host channel adapter receive queue (paragraphs 0102 and 0106-0107; *Acharya*: col.4 lines 4-13 and col.5 lines 9-24).

25. Claims 35 and 41 are substantially equivalent to claim 29 and are therefore rejected under the same basis.

26. Per claim 30, *Petty* teaches the method of claim 28, wherein the InfiniBand link layer header identifies an external network (paragraphs 0023, 0026, 0046, 0053, 0056, 0061, 0081, 0083, 0126 and 0139).

27. Claims 36 and 42 are substantially equivalent to claim 30 and are therefore rejected under the same basis.

28. **Claims 26, 32 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Acharya* (USPN 6,459,698) in view of *Petty* (US Publication 2004/0128398) and further in view of *Karpoff* (US Publication 2001/0049740). This rejection was set forth in the previous Office action mailed July 27, 2005.**

29. Per claim 26, *Acharya* and *Petty* teach the method of claim 25, as applied above. *Acharya* teaches generating link layer fields, such as global routing headers (col.6 lines 43-56), yet *Acharya* and *Petty* fail to explicitly identifying an output port of the router includes

examining one of an InfiniBand Global Router Header's Destination Global Identifier and an IPv6 Destination Address. However, *Karpoff* teaches the identifying and addressing scheme provided by IPv6 incorporated with the use of InfiniBand global routing which would implicitly include a header/identifier mechanism (paragraph 0088).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of *Acharya* and *Petty* and combine the teachings of *Acharya*, *Petty* and *Karpoff* to include identifying a routing output port by examination of the InfiniBand global ID and IPv6 destination address for the purpose of tracking and maintenance of the routing activity with the use of an identifier and an address, furthermore the use of IPv6 essentially provides increased available address space, permitting the extended capabilities of the system.

30. Claims 32 and 38 contain limitations that are substantially equivalent to claim 26 and are therefore rejected under the same basis.

(10) Response to Argument

- A. **Appellant argues that *Acharya* fails to teach passing data directly from a host channel adapter to an Internet Protocol router; and because the router of *Acharya* includes the host channel adapter within the router itself, *Acharya* cannot teach passing data from a host channel adapter directly to a router.**

In response to argument A, Examiner respectfully disagrees. With reference to Figures 2 and 4 of *Acharya*, the router includes a host channel adapter (HCA) and is therefore equipped to receive Internet Protocol (IP) data packets and output the IP data packets onto an InfiniBandTM network (col.8 lines 2-62). It is the controller of the router that outputs an IP data packet on the InfiniBandTM network, by issuing a request to the HCA that is configured to generate the InfiniBandTM packet (col.8 lines 10-14). Figure 4 of *Acharya* explicitly depicts the communication of the router with the HCA, wherein the controller and DS_SL mapping table of the router are able to pass data directly to and from the HCA (col.8 lines 2-5). Although the router of *Acharya* does include an HCA, the HCA and router function together as a combination, where the HCA functions as a distinct entity within the router, so that the router as a whole is configured to send and receive data packets on an InfiniBandTM network. Therefore the addition of the HCA, allows the routing portions (the controller and mapping table) to directly interact with the HCA portion and provides IP-to-InfinibandTM packet mapping capabilities within the housing hardware of a single device. Therefore *Acharya* meets the scope of the claim limitations.

- B. Appellant argues that *Acharya* fails to teach the router being “connected directly” to the host channel adapter because *Acharya* teaches that the router itself includes the host channel adapter.**

In response to argument B, Examiner respectfully disagrees. *Acharya*’s implementation of the router including the host channel adapter (HCA) meets appellant’s claim limitation of the router being “connected directly” to the HCA. Appellant’s claim language does not specify the bounds or degree of direct connectivity between the router and HCA. Thus, in light of the broadest interpretation, the claim language “connected directly” does not preclude *Acharya*’s embodiment of a router “including” an HCA, since the inclusion achieves the “connected directly” function of the claim invention.

According to the MPEP:

*During patent examination, the pending claims must be “given *>their< broadest reasonable interpretation consistent with the specification.”> In re Hyatt, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000).< Applicant always has the opportunity to amend the claims during prosecution, and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. In re Cortright, 165 F.3d 1353, 1359, 49 USPQ2d 1464, 1468 (Fed. Cir. 1999). During examination, the claims must be interpreted as broadly as their terms reasonably allow.*

(MPEP: 2111[R-1] and 2111.01 [R-3])

Therefore *Acharya* meets the scope of the claim limitations.

- C. **Appellant argues that neither *Acharya* nor *Petty* teaches passing data from the host channel adapter directly to an Internet Protocol router or the router being connected directly to the host channel adapter; therefore the combination of *Acharya* and *Petty* fails to render Appellant's claims unpatentable.**

In response to argument C, Examiner's response to arguments A and B above support *Acharya*'s teaching of passing data from the host channel adapter directly to an Internet Protocol router and the router being connected directly to the host channel adapter. As indicated in the Grounds of Rejection (section (9)), prior art reference *Petty* was not used in combination with *Acharya* to teach passing data from the host channel adapter directly to an Internet Protocol router or the router being connected directly to the host channel adapter. *Petty* was referenced for teaching the selection of an output port based on the parsed header data (paragraphs 0052-0059, 0061, 0068, 0088, 0102-0104, 0112-0116 and 0136). Thus, Appellant's argument of *Petty* is not in accordance with the 35 U.S.C 103(a) rejection made in view of *Petty* in the Office action issued on July 27, 2005.

- D. **Appellant argues that prior art reference *Karpoff* fails to teach passing data from the host channel adapter directly to an Internet Protocol router or the router being connected directly to the host channel adapter; therefore the combination of *Acharya*, *Petty* and *Karpoff* fails to render Appellant's claims unpatentable.**

In response to argument D, Examiner's response to arguments A and B above support *Acharya*'s teaching of passing data from the host channel adapter directly to an Internet Protocol router and the router being connected directly to the host channel adapter. As indicated in the Grounds of Rejection (section (9)), prior art reference *Karpoff* was not used in combination with *Acharya* and *Pettey* to teach passing data from the host channel adapter directly to an Internet Protocol router or the router being connected directly to the host channel adapter. *Karpoff* was referenced for teaching the identifying and addressing scheme provided by IPv6 incorporated with the use of InfiniBandTM global routing (paragraph 0088). Thus, Appellant's argument of *Karpoff* is not in accordance with the 35 U.S.C 103(a) rejection made in view of *Karpoff* in the Office action issued on July 27, 2005.

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(11) Related Proceeding(s) Appendix

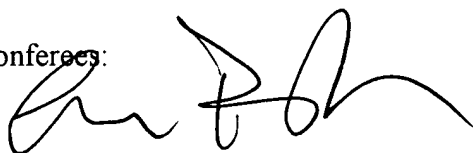
No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.


Respectfully submitted,

KDS

Conferees:



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